PUBLIC DEBT AND ECONOMIC GROWTH: AN EMPIRICAL ASSESSMENT

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Abstract

Being economical policymaker, Government of Jordan claims that public debt has been used mainly to finance productive investment which is expected to enhance economic growth.

To investigate the effect of public debt on growth using the per capita income approach, the study augments a growth and debt specifications based on conditional convergence by adding several growth variables.

This paper examines the impact of public debt on the performance of the Jordanian economy using new econometric techniques that provide appropriate procedures for estimation and inference.

Empirical evidence shows that population growth and public debt have played very crucial role towards economic growth in Jordan. It shows that public debt has promoted economic growth, while population growth has hindered it. Thus, if Jordan is hoping to attain sustained economic growth, positive effect of public debt should be maintained while negative effect of population growth should be reduced.

Keywords: Debt and Growth, Vector Error Correction Model, Granger Causality

1.1 Introduction

Economic theory suggests that reasonable levels of borrowing by a developing country are likely to enhance its economic growth (Pattillo, Ricci, and Poirson 2002). In order to encourage growth, countries at early stages of development like Jordan borrow to augment what they have because of dominance of small stocks of capital hence they are likely to have investment opportunities with rates of return higher than that of their counterparts in developed economies. This becomes effective as long as borrowed funds and some internally ploughed back funds are properly utilized for productive investment. And do not suffer from macroeconomic instability, policies that distort economic incentives, or sizable adverse shocks. Growth therefore is likely to increase and allow for timely debt

repayments. When this cycle is maintained for a period of time growth will affect per capita income positively. These predictions are known to hold even in theories based on the more realistic assumption that countries may not be able to borrow freely because of the risk of debt denial.

Although the debt overhang models do not analyze the effects of debt on growth explicitly, the implication still remains that large debt stocks lower growth by partly reducing investment. But the incentive effects associated with debt stocks tend to reduce the benefits expected from policy reforms that would enhance efficiency and growth, such as trade liberalization and fiscal adjustment. When this happens the government will be less willing to incur current costs if it perceives that the future benefit in terms of higher output will accrue partly to foreign lenders. Supporting the conception, Stiglitz (2000; 790) contributed that government borrowing can crowd out investment, which will reduce future output and wages. When output and wages are affected the welfare of the citizens will be affected too.

Soludo (2003), opined that countries borrow for two broad categories: macroeconomic reasons [higher investment, higher consumption (education and health)] or to finance transitory balance of payments deficits [to lower nominal interest rates abroad, lack of domestic long-term credit, or to circumvent hard budget constraints]. This implies that economy indulges in debt to boost economic growth. He is also of the opinion that once an initial stock of debt grows to a certain threshold, servicing them becomes a burden, and countries find themselves on the wrong side of the debt-laffer curve, with debt crowding out investment and growth. This seems to be the position of Jordan today because investment, which will accordingly result to high-speed growth, is moving sporadically in both positive and negative directions.

For the past two decades, Jordan has borrowed large amounts, with the hope to put them on a faster route to development through higher investment, faster growth but on the contrast economic growth is staggering at the back door amidst excess debt, albeit that was the initial intention. It is then obvious that the Jordan indebtedness has gone beyond such limits and it is noteworthy if such limit is dictated to help the economy in their pursuit towards debt free or less debt burden that will enhance economic growth.

1.2 Statement of the Problem

It is well - known that Jordan's natural resource base is relatively limited. Indeed, this is why, traditionally, the country has relied on external debt, remittances and foreign aid in managing its economic affairs. Thus, over the past three decades, Jordan has borrowed large amounts. The hope was that these loans would put them on a faster development path through higher investment and faster growth. But as public debt ratios reached very

high levels in the end of 1988 to figure more than 190% of GDP, also the deficit in the general budget was equal to about 25% of GDP. As a result, the Government devalued the Jordanian Dinar (JD), liberalized the foreign exchange market and embarked on a decade-long austerity and restructuring program supervised by both the International Monetary Fund (IMF) and the World Bank (WB).

Analyzing the economic performance of Jordan is very difficult. The country has passed through many disturbances and these make the detection of any underlying economic trends an extremely difficult task. However, since the end of the 1991 Gulf crisis and its economic impact, the Jordanian economy has been passing through relative stability with (2% - 7%) as rate of economic growth.

Relative to the current economic stability and abit listless performance of the economy, there remain a number of important problems and these are unemployment, poverty, and a chronic balance of trade deficit. It is believed that the unemployment rate is currently around 13% of the labor force and poverty is estimated to be around 25% of the population. Moreover, it is well-known that the Jordanian economy has been suffering from a chronic trade deficit problem. In 2006, 2007 and 2008, for example, the trade deficit was equal to $3.6 billion, $4.5 billion, and $4.8 billion respectively. These values represent an annual mean of about 30% of GDP.

Given Jordan's economic circumstances, it can be stated that the challenge is to succeed in creating a dynamic economy which is able to compete regionally and internationally, increase real GDP growth by more than the increase in population, reduce dependence on external transfers, reduce poverty and unemployment and

Finally, to reduce the external debts overhang. This is why current economic policies are committed to the principle of economic liberalization, which includes:

- Private sector development
- Export promotion
-Privatization
- Local, Arab and foreign investment promotion
- Utilization of information technology for development

In addition, Jordan has made the decision to liberalize its trade regime and integrate with the world economy by joining the World Trade Organization (WTO) and signing the Association Agreement with the European Union. In other words, Jordan has decided to become an integral part of "economic globalization".

1.3 Objectives of the Study

Since it is obvious that this issue is very much country-specific, In other words, there is a need for case-by-case studies that take into consideration each country's unique characteristics. This study is set out to find:

- The quantitative effect of public debt on economic growth in Jordan using the per capita income approach.

2.1 Theoretical Underpinnings and Variable Linkages

Though Growth literature has lots concerning the relationship between debt and economic growth issues, Gong and Zou [2002] suggested that volatility in government spending can positively or negatively associated affect economic growth depending on the inter-temporal elasticity in consumption. At another instance Stiglitz [2000] opined that with an annual growth rate of over 5% there is likely to be increased incomes in poor countries.

Review of Empirical Literature

Most empirical studies either dealt with debt and growth. Arias [2002] showed a striking diversity of experiences with growth episodes. This became clear in the study carried out by him where it is seen that while some countries over some periods achieve a significant reduction in poverty as the economy grows, others obtain much less appreciable progress. He then concludes that how growth can reduce poverty depends on the pattern of growth as well as on the initial inequality of income and assets and its evolution over time.

Ugo Panizza (2013) found that the presence of thresholds and, more in general, of a non-monotone relationship between debt and growth is not robust to small changes in data coverage and empirical techniques.

Were (2001) concluded from her study that Sub-Saharan Africa (SSA) is still plagued by its heavy external debt burden compounded by massive poverty and structural weaknesses of most of the economies, which has made attainment of rapid and sustainable growth and development difficult.

According to the World Bank study on Growth and Debt on Philippines, the result shows that weak external demand for Philippine exports is dampening growth. This then implies that without stronger economic growth and more vigorous outreach, the social and economic discontent driving the terrorism and insurgent movements in the country will continue unabated hence plunging more of the populace into abject poverty. The cause of this might have been due to fact that the budget deficit ballooned and became almost twice the IMF target for financial stability.

This situation saddled with a large foreign debt made its currency reserves dangerously low. Such financial quicksand is a weak foundation for stronger long-term economic growth in the Philippines.

In yet another study showing an insight from cross-country regression analysis by Hasen [2001] on the impact of aid and external debt on growth and investment, the regression results were suggestive of a series of interesting relationships. This then is to say as a result of the explanatory regressions there is quite strong evidence of positive impact of aid both on the growth rate in GDP per capita and the investment rate. Empirical analyses reporting negative effects of debt and debt service were also supported while a novelty in the study was the evidence of a complex interplay between the level of external debt and aid flows just as the macroeconomic effectiveness of aid is negatively related to the level of indebtedness which is more severe in highly aid dependent countries.

In Tanzania according to Oxfam [1998], experience illustrates that the effects of debt go beyond finance to impact on the lives of vulnerable households. Given the limited domestic revenues available to governments in Tanzania, the claims of foreign creditors reached alarming proportions while public sector external debt absorbs over 40 per cent of domestic revenues. According to Oxfam [1998], excessive debt servicing is not the only the problem faced by the Tanzanian government but the added pressures associated with low economic growth, high population growth, aid dependence, and mismanagement. The longer-terms costs associated with debt crowding out foreign investment become more difficult to quantify.

Pattillo, Ricci, and Poirson (2001), in their paper assessed the non-linear impact of external debt on growth using a panel data of ninety three [93] countries over 1969-98 employing econometric methodologies. Their findings suggested the average impact of debt becomes negative at about 160-170 percent of exports or 35-40 percent of Gross Domestic Product [GDP]. Their findings also show that the marginal impact of debt starts being negative at about half of these values. In their study it was seen that for a country with an average indebtedness [in net present value] below 100 percent of exports and above 300 percent of exports seems to be in excess of 2 percent per annum. Also for countries that are to benefit from debt reduction under the current Heavily Indebted Poor Country [HIPC] initiative, per capita growth might increase by 1 percentage point while high debt reduces growth mainly by lowering the efficiency of investment rather than volume.

3.1 Methodology, Analysis and Results

The study covers the period from 1991 to 2010. Annual data for the period was collected and employed for the analysis. The data employed in

the study was collected from secondary sources, such as the Annual Reports and Statement of Accounts and the Statistical Bulletin of the Central Bank of Jordan [CBJ], and the International Financial Statistics Year Book of the International Monetary Fund (IMF) and World Economic Outlook [WEO] Data.

The models employed in this study rely on Pattillo, Ricci, and Poirson (2001) Growth and Debt models due to the presence of sub components working together. To investigate the impact of public debt on growth using the per capita income approach, the study augments a growth and debt specifications based on conditional convergence by adding several debt and growth variables with per capita growth as the dependent variable. On the right hand side appears the some growth control variables, which includes the investment rate, the population growth rate, (all in logarithm forms) and a number of other variables to control for differences in total factor productivity (openness and fiscal balance), and exogenous shocks (terms of trade). The models will be used to find out country (Jordan) specific effect.

The first model specification as presented below assumes a linear relationship between public debt and growth with poverty.

$$\mathbf{Y_{it} = \alpha_{(it)} + \beta X_{it} + \gamma DT_{it} + \varepsilon_{it}}$$

Y_{it} stands for per capita growth, X_{it} the economic growth control variables [V_{it} is the investment rates, P_{it} is population growth rate , IF_{it} is inflation rate, T_{it} is the terms of trade rate, B_{it} is the rate of fiscal balance to GDP while N_{it} represents the Openness]. DT_{it} represents the rate of public debt to GDP and DS_{it} is for debt service payments.

Taking the logarithm form of the equation will yield equation 6 below with "In" standing for the natural logarithm

$$\mathbf{InY_{it} = \alpha_{(it)} + \beta InX_{it} + \gamma InDT_{it} + \varepsilon_{it}}$$

Using Ordinary Least Squares (OLS) regression method the following estimated equation was obtained [SPSS]**:**

result 1 **Model Summary[b]**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.845[a]	.714	.505	.8464208274	1.539

a. Predictors: (Constant), ln DSit, ln Vit, ln IFit, ln Tit, ln Bit, ln Pit, ln Nit, ln DTit
b. Dependent Variable: ln Yit

result 2 **ANOVA[b]**

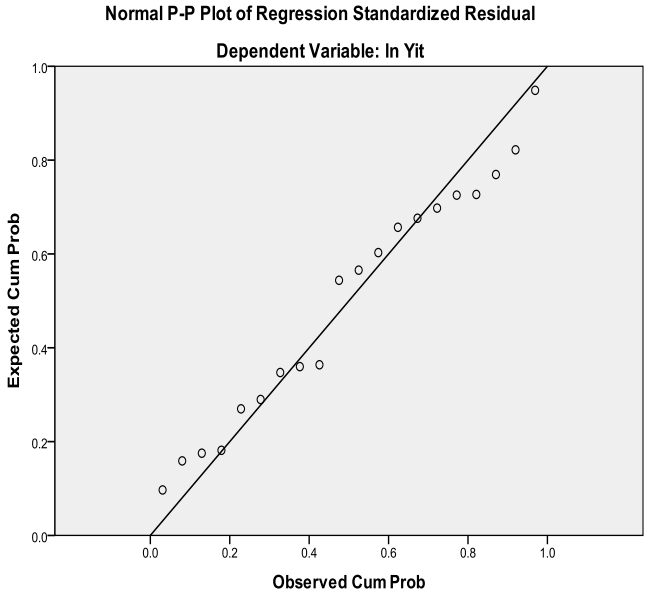
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	19.630	8	2.454	3.425	.031[a]
	Residual	7.881	11	.716		
	Total	27.510	19			

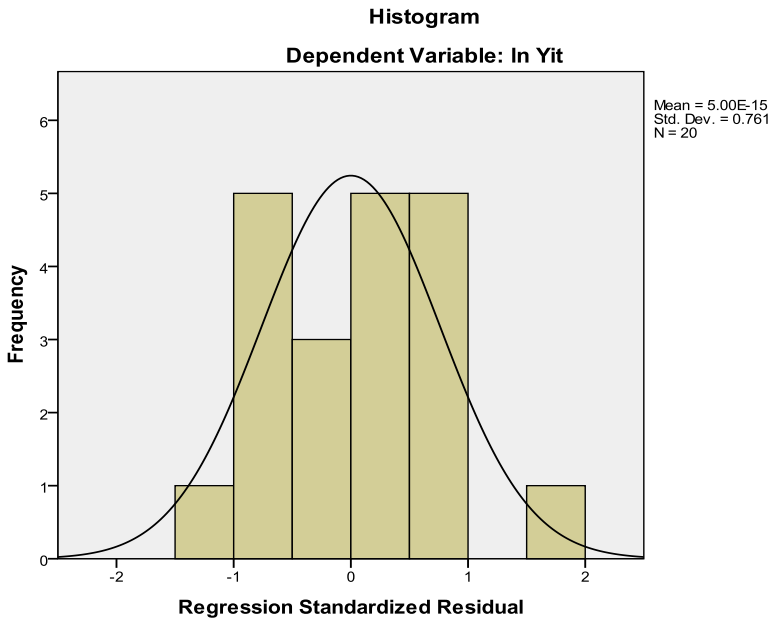
a. Predictors: (Constant), ln DSit, ln Vit, ln IFit, ln Tit, ln Bit, ln Pit, ln Nit, ln DTit
b. Dependent Variable: ln Yit

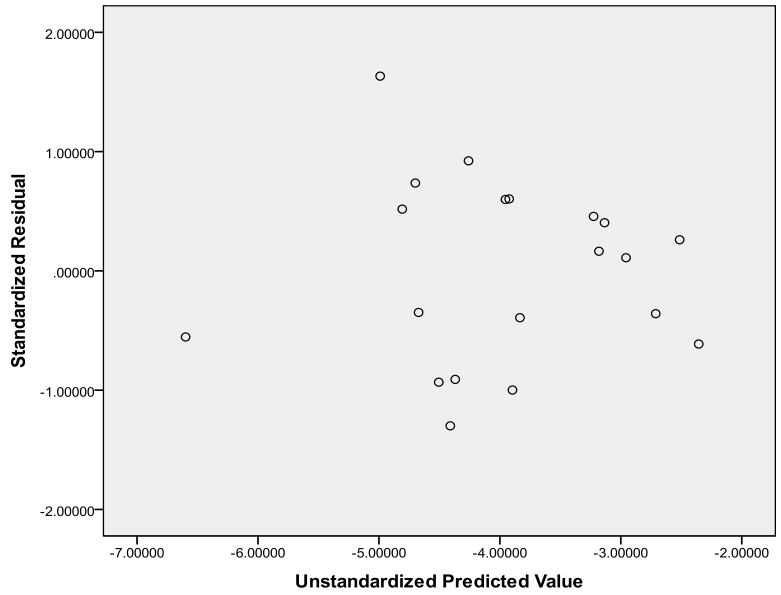
result 3 **Coefficients[a]**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-42.741	14.335		-2.982	.012
	ln Vit	-3.937	1.842	-.629	-2.137	.056
	ln IFit	.686	.292	.851	2.348	.039
	ln Nit	2.583	1.768	.678	1.461	.172
	ln Tit	-6.118	3.417	-.562	-1.790	.101
	ln Pit	-9.932	3.043	-2.284	-3.264	.008
	ln Bit	9.312	4.839	.606	1.924	.081
	ln DTit	10.539	2.903	3.023	3.630	.004
	ln DSit	-1.484	1.127	-.666	-1.317	.215

a. Dependent Variable: ln Yit







result 4 **Tests of Normality**

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Standardized Residual	.126	20	.200*	.968	20	.707

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

4.0 Summary of Analyses

The above results are attempted to show the effects of public debt and others variables on economic growth in Jordan. The result has shown that economic growth in Jordan is affected by public debt, population growth and inflation rate. In other words economic growth in Jordan is debt and population elastic. This is shown in result 3. Similarly result 2 presents the situation of involving variables in the regression estimates. The Variables employed in this study include rate of population growth, the investment rates, terms of trade, rate of fiscal balance to Gross Domestic Product [GDP] and the degree of openness. Likewise public Debt (Domestic and External Debt) and Debt service rates were employed to take care of Debt.

The values of R^2 [0.714] and the adjusted R^2 [0.505] in the above regression estimates indicate that our model effectively explain the influence of public debt using the variables given above on economic growth [per capita income] in Jordan. The value of Durbin-Watson [DW] Statistic in the regression results 1 is [1.539] which shows that the variables are not serially correlated. Result 3 shows that the t-statistics test confirms that the coefficients of public debt, population growth and inflation rate in our model are significant at 5% level of significance. The F-Statistics are [3.425] thereby confirming that our model sufficiently explain the effect of included variables on economic growth in Jordan.

4.1 Conclusion

The study has elucidated the effect public debt has on economic growth in Jordan using the per capita income approach. The study employed a vector of growth variables like public debt (domestic and external debt), debt service, population rate, inflation rate and fiscal balance amongst others. The results of our regression estimates show that the coefficients confirm our a priori conditions for the expected effect of public debt on economic growth applying the per capita income approach in Jordan.

Empirical evidence from the study results suggest that investment rates, Terms of Trade, Openness, debt service and Fiscal Balance all haven't a significant relationship with economic growth in Jordan. On other hand it suggests that public debt, population growth and inflation rate all have significant relationship with economic growth in Jordan. Also, it shows that the population growth has a strong, negative and significant relationship with economic growth, while public debt and inflation rate have positive and significant relationship with economic growth in Jordan. This then suggests that public debt is yet to attain what it ought to take its required position towards economic growth. In contrast, population growth is significantly in pulling down economic growth.

The study has elucidated that the population growth has been hampering economic growth in Jordan, so its effect should be reduced, Whereas, public debt and inflation rate promote economic growth which should be maintained, Furthermore, other variables like, Terms of Trade, Fiscal Balance and investment rate which doesn't have significant effect on growth need to be improved, if Jordan is hoping to attain sustained economic growth.

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